

BBBBBBBBBBBB		AAAAAAA		SSSSSSSSSS		RRRRRRRRRR		TTTTTTTTTT		LLL
BBBBBBBBBBBB		AAAAAAA		SSSSSSSSSS		RRRRRRRRRR		TTTTTTTTTT		LLL
BBBBBBBBBBBB		AAAAAAA		SSSSSSSSSS		RRRRRRRRRR		TTTTTTTTTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA	SSS		RRR	RRR	TTT		LLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRRRRRRRRR		TTT		LLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRRRRRRRRR		TTT		LLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRRRRRRRRR		TTT		LLL
BBB	BBB	AAAAAAAAAAAA			SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAAAAAAAAAAA			SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAAAAAAAAAAA			SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA		SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA		SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA		SSS	RRR	RRR	TTT		LLL
BBB	BBB	AAA	AAA		SSS	RRR	RRR	TTT		LLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRR	RRR	TTT		LLLLLLLLLLLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRR	RRR	TTT		LLLLLLLLLLLL
BBBBBBBBBBBB		AAA	AAA	SSSSSSSS		RRR	RRR	TTT		LLLLLLLLLLLL


```
BBBBBBBBB      AAAAAA      SSSSSSSS      EEEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FFFFFFFFFF      SSSSSSSS
BBBBBBBBB      AAAAAA      SSSSSSSS      EEEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FFFFFFFFFF      SSSSSSSS
BB      BB      AA      AA      SS      EE      NN      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      DD      DD      DD      FF      SS
BBBBBBBBB      AA      AA      SSSSSS      EEEEEEEEEEE      NN      NN      DD      DD      DD      FF      SSSSSS
BBBBBBBBB      AA      AA      SSSSSS      EEEEEEEEEEE      NN      NN      DD      DD      DD      FF      SSSSSS
BB      BB      AAAAAAAAAA      SS      EE      NN      NN      DD      DD      DD      FF      SS
BB      BB      AAAAAAAAAA      SS      EE      NN      NN      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      NN      DD      DD      DD      FF      SS
BB      BB      AA      AA      SSSSSSSS      EEEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FF      SSSSSSSS
BBBBBBBBB      AA      AA      SSSSSSSS      EEEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FF      SSSSSSSS
.....
LL      IIIIII      SSSSSSSS
LL      IIIIII      SSSSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SSSSSS
LL      II      SSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SS
LLLLLLLLLLLL      IIIIII      SSSSSSSS
LLLLLLLLLLLL      IIIIII      SSSSSSSS
```


! File: BASENDDFS.B32 Edit:MDL1004

```

0001 0 MODULE BASSEND_DFS (
0002 0 IDENT = '1-004'
0003 0 ) =
0004 1 BEGIN
0005 1
0006 1 *****
0007 1 *
0008 1 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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0024 1 * SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
0025 1 *
0026 1 *
0027 1 *****
0028 1
0029 1
0030 1
0031 1 **
0032 1 FACILITY: BASIC-PLUS-2 Frame Support
0033 1
0034 1 ABSTRACT:
0035 1
0036 1     These routines set up and tear down frames for BASIC-PLUS-2.
0037 1     Frames are used for main routines, external functions,
0038 1     external subroutines, internal functions (both DEFs and DEF*s)
0039 1     internal subroutines (GOSUBs) and condition handlers.
0040 1
0041 1 ENVIRONMENT: VAX-11 user mode
0042 1
0043 1 AUTHOR: John Sauter, CREATION DATE: 10-Oct-78
0044 1
0045 1 MODIFIED BY:
0046 1
0047 1     , : VERSION
0048 1
0049 1     1-001 - Original. This is just a skeleton.
0050 1     1-002 - Change LIB$$ and OTS$$ to STR$. JBS 21-MAY-1979
0051 1     1-003 - Code this routine, based on BASSEND_DEF. JBS 03-AUG-1979
0052 1     1-004 - signal FNEWITFUN for kinds of frames that we know about, rather
0053 1             than simply signalling PROLOSSOR blindly. MDL 22-Feb-1984
0054 1 --
0055 1
0056 1
0057 1 <BLF/PAGE>

```



```
59 0058 1 |
60 0059 1 | SWITCHES:
61 0060 1 |
62 0061 1 |
63 0062 1 | SWITCHES ADDRESSING_MODE (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
64 0063 1 |
65 0064 1 |
66 0065 1 | LINKAGES:
67 0066 1 |
68 0067 1 |
69 0068 1 | LINKAGE
70 0069 1 |     BASSINIT_LINK = JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2) : !
71 0070 1 |     GLOBAL (BSFSA_MAJOR_STG = 11, BSFSA_MINOR_STG = 10, BSFSA_TEMP_STG = 9) !
72 0071 1 |     NOPRESERVE (8, 7, 6, 5, 4, 3, 2, 1, 0);
73 0072 1 |
74 0073 1 | REQUIRE 'RTLIN:STRLNK'; ! String facility linkages
75 0258 1 |
76 0259 1 |
77 0260 1 | TABLE OF CONTENTS:
78 0261 1 |
79 0262 1 |
80 0263 1 | FORWARD ROUTINE
81 0264 1 |     BASSEND_DFS_R8 : NOVALUE BASSINIT_LINK; ! end DEF*
82 0265 1 |
83 0266 1 |
84 0267 1 | INCLUDE FILES:
85 0268 1 |
86 0269 1 |
87 0270 1 | REQUIRE 'RTLIN:RTLPSECT'; ! macros for defing psects
88 0365 1 |
89 0366 1 | REQUIRE 'RTLIN:BASFRAME'; ! Define frame structure
90 0569 1 |
91 0570 1 | REQUIRE 'RTLIN:BASINARG'; ! Define argument list
92 0654 1 |
93 0655 1 |
94 0656 1 | MACROS:
95 0657 1 |
96 0658 1 |     NONE
97 0659 1 |
98 0660 1 | EQUATED SYMBOLS:
99 0661 1 |
100 0662 1 |     NONE
101 0663 1 |
102 0664 1 | PSECTS:
103 0665 1 |
104 0666 1 | DECLARE_PSECTS (BAS); ! declare psects for BASS facility
105 0667 1 |
106 0668 1 | OWN STORAGE:
107 0669 1 |
108 0670 1 |     NONE
109 0671 1 |
110 0672 1 | EXTERNAL REFERENCES:
111 0673 1 |
112 0674 1 |
113 0675 1 | EXTERNAL ROUTINE
114 0676 1 |     BASS$STOP : NOVALUE, ! signals error
115 0677 1 |     STR$FREE1_DX_R4 : STR$JSB_GETFRE, ! Deallocate a string
```

```

: 116      0678 1      BAS$$UNWIND : NOVALUE,          ! Unwind a frame
: 117      0679 1      BAS$HANDLER;                    ! Marker for BASIC frame
: 118      0680 1
: 119      0681 1      !+
: 120      0682 1      !- The following are the error codes used in this module.
: 121      0683 1      !-
: 122      0684 1
: 123      0685 1      EXTERNAL LITERAL
: 124      0686 1      BAS$K_RETWITGOS : UNSIGNED (8),    ! RETURN without GOSUB
: 125      0687 1      BAS$K_PROLOSSOR : UNSIGNED (8),    ! Program lost, sorry
: 126      0688 1      BAS$K_NOTIMP : UNSIGNED (8),        ! Not implemented
: 127      0689 1      BAS$K_FNEWITFUN : UNSIGNED (8),     ! FNEND without FUNCTION CALL
: 128      0690 1      BAS$K_ERRTRANEE : UNSIGNED (8);     ! ERROR trap needs RESUME
: 129      0691 1

```



```
131 0692 1 GLOBAL ROUTINE BASSEND_DFS_R8 (
132 0693 1     ARGLIST
133 0694 1     ) : NOVALUE BASSINIT_LINK =
134 0695 1
135 0696 1 ++
136 0697 1 FUNCTIONAL DESCRIPTION:
137 0698 1
138 0699 1     Tear down a frame for a BASIC-PLUS-2 DEF*.
139 0700 1     All heap storage is deallocated. The argument is the same
140 0701 1     as for BASSINIT_DFS_R8, for validity checking.
141 0702 1
142 0703 1 FORMAL PARAMETERS:
143 0704 1
144 0705 1     ARGLIST.ra.v    List of information used to set up the
145 0706 1                    frame. See BASIC-PLUS-2/VAX Description
146 0707 1                    of Generated Code for details.
147 0708 1
148 0709 1 IMPLICIT INPUTS:
149 0710 1
150 0711 1     The frame, as set up by BASSINIT_DFS_R8.
151 0712 1
152 0713 1 IMPLICIT OUTPUTS:
153 0714 1
154 0715 1     NONE
155 0716 1
156 0717 1 ROUTINE VALUE:
157 0718 1
158 0719 1     NONE
159 0720 1
160 0721 1 COMPLETION CODES:
161 0722 1
162 0723 1     NONE
163 0724 1
164 0725 1 SIDE EFFECTS:
165 0726 1
166 0727 1     Deallocates the heap storage local to this DEF*.
167 0728 1
168 0729 1 --
169 0730 1
170 0731 2 BEGIN
171 0732 2
172 0733 2 EXTERNAL REGISTER
173 0734 2     BSFSA_MAJOR_STG : REF BLOCK [0, BYTE],
174 0735 2     BSFSA_MINOR_STG : REF BLOCK [0, BYTE],
175 0736 2     BSFSA_TEMP_STG : REF VECTOR;
176 0737 2
177 0738 2 BUILTIN
178 0739 2     FP;
179 0740 2
180 0741 2 MAP
181 0742 2     ARGLIST : REF BLOCK [0, BYTE] FIELD (BASSINIT_ARGS);    ! arg list
182 0743 2
183 0744 2 REGISTER
184 0745 2     FMP : REF BLOCK [0, BYTE] FIELD (BSF$FCD);    ! pointer to FCD
185 0746 2     PREV_FMP : REF BLOCK [0, BYTE] FIELD (BSF$FCD); ! previous FCD
186 0747 2
187 0748 2 !+
```

```

188 0749 2 ! First cut back any GOSUB frames. We wish to make the presence of
189 0750 2 ! the GOSUB frame invisible except on traceback.
190 0751 2 !-
191 0752 2 ! FMP = .FMP;
192 0753 2 !-
193 0754 2 ! WHILE (.FMP [BSF$B_PROC_CODE] EQL BSF$K_PROC_GOSB) DO
194 0755 2 ! BEGIN
195 0756 2 !+
196 0757 2 ! We have a GOSUB frame, remove it. Note we do not restore any
197 0758 2 ! registers it might have saved.
198 0759 2 !-
199 0760 2 ! BAS$$UNWIND (.FMP);
200 0761 2 ! PREV_FMP = .FMP [BSF$A_SAVED_FP];
201 0762 2 !-
202 0763 2 ! IF (.PREV_FMP [BSF$A_HANDLER] NEQA BAS$HANDLER)
203 0764 2 ! THEN
204 0765 2 !+
205 0766 2 ! The previous frame is not a BASIC frame. This is unreasonable
206 0767 2 ! since GOSUBs should only be callable from inside a BASIC main
207 0768 2 ! procedure.
208 0769 2 !-
209 0770 2 ! BAS$$STOP (BAS$K_RETWITGOS);
210 0771 2 !-
211 0772 2 ! FMP = .PREV_FMP;
212 0773 2 ! END;
213 0774 2 !-
214 0775 2 !+
215 0776 2 ! Make sure this is a DEF frame.
216 0777 2 !-
217 0778 2 !-
218 0779 2 ! CASE .FMP [BSF$B_PROC_CODE] FROM BSF$K_PROC_MAIN TO BSF$K_PROC_IOL OF
219 0780 2 ! SET
220 0781 2 ! [BSF$K_PROC_ONER] :
221 0782 2 ! BAS$$STOP (BAS$K_ERRTRANEE);
222 0783 2 !-
223 0784 2 ! [BSF$K_PROC_DEFS] :
224 0785 2 ! BEGIN
225 0786 2 ! 0
226 0787 2 ! END;
227 0788 2 !-
228 0789 2 ! [BSF$K_PROC_MAIN, BSF$K_PROC_SUB, BSF$K_PROC_DEF] :
229 0790 2 ! BAS$$STOP (BAS$K_FNEWITFON);
230 0791 2 !-
231 0792 2 ! [INRANGE, OTRANGE] :
232 0793 2 ! BAS$$STOP (BAS$K_PROLOSSOR);
233 0794 2 !-
234 0795 2 ! TES;
235 0796 2 !-
236 0797 2 !+
237 0798 2 ! Check to be sure that this is the correct exit. This should
238 0799 2 ! only fail if the user branches from one DEF* into the body of
239 0800 2 ! another.
240 0801 2 !-
241 0802 2 !-
242 0803 2 ! IF (.FMP [BSF$A_INIT_ARG] NEQA .ARGLIST)
243 0804 2 ! THEN
244 0805 2 !+

```



```
245 0806 2 ! The argument lists are not at the same address. This exit must not
246 0807 2 ! correspond to the entry. Signal an error.
247 0808 2
248 0809 2 BAS$$STOP (BAS$K_FNEWITFUN);
249 0810 2
250 0811 2 !+
251 0812 2 ! Deallocate any temporary string storage.
252 0813 2 !-
253 0814 2
254 0815 2 INCR COUNTER FROM 1 TO .ARGLIST [BAS$L_IN NO TST] DO
255 0816 2 STR$FREE1_DX_R4 (BSF$A_TEMP_STG [(COUNTER - 1)*2]);
256 0817 2
257 0818 2 !+
258 0819 2 ! Deallocate local dynamic strings.
259 0820 2 !-
260 0821 2
261 0822 2 INCR COUNTER FROM 1 TO .ARGLIST [BAS$W_IN NO DST] DO
262 0823 2 STR$FREE1_DX_R4 (.FMP [BSF$A_STR_DESC] + (2*UPVAL*(COUNTER - 1)));
263 0824 2
264 0825 2 !+
265 0826 2 ! All done. The 'RET' instruction done by the compiled code
266 0827 2 ! will cut back the stack, so we don't need to do it here.
267 0828 2 !-
268 0829 2 FP = .FMP;
269 0830 2 RETURN;
270 0831 2 END;
```

! of BASSEND_DFS_R8

```
.TITLE BASSEND_DFS
.IDENT \1-004\

.EXTRN BAS$$STOP, STR$FREE1_DX_R4
.EXTRN BAS$$UNWIND, BAS$HANDLER
.EXTRN BAS$K_RETWITGOS
.EXTRN BAS$K_PROLOSSOR
.EXTRN BAS$K_NOTIMP, BAS$K_FNEWITFUN
.EXTRN BAS$K_ERRTRANEE

.PSECT _BAS$CODE,NOWRT, SHR, PIC,2
```

57	50	DO	00000	BASSEND_DFS_R8::	MOV	R0, R7	0692
55	5D	DO	00003		MOVL	FP, FMP	0752
06	E5	A5	91 00006	1\$:	CMPB	-27(FMP), #6	0754
		29	12 0000A		BNEQ	3\$	
		55	DD 0000C		PUSHL	FMP	0760
00000000G	00	01	FB 0000E		CALLS	#1, BAS\$\$UNWIND	
	52	OC	A5 D0 00015		MOVL	12(FMP), PREV_FMP	0761
	50	00000000G	00 9E 00019		MOVAB	BAS\$HANDLER, R0	0763
	50	62	D1 00020		CMPL	(PREV_FMP), R0	
		0B	13 00023		BEQL	2\$	
	7E	00G	8F 9A 00025		MOVZBL	#BAS\$K_RETWITGOS, -(SP)	0770
00000000G	00	01	FB 00029		CALLS	#1, BAS\$\$STOP	
	55	52	D0 00030	2\$:	MOVL	PREV_FMP, FMP	0772
		D1	11 00033		BRB	1\$	0754
	07	01	E5 A5 8F 00035	3\$:	CASEB	-27(FMP), #1, #7	0779
001C	0010	001C	001C 0003A	4\$:	.WORD	7\$-4\$,-	

0010

0016

0010

0027

00042

```

7E      00G  8F  9A 0004A 5$:  MOVZBL #BASSK_PROLOSSOR, -(SP)
      0A  11 0004E      BRB      8$
7E      00G  8F  9A 00050 6$:  MOVZBL #BASSK_ERRTRANEE, -(SP)
      04  11 00054      BRB      8$
00000000G 7E      00G  8F  9A 00056 7$:  MOVZBL #BASSK_FNEWITFUN, -(SP)
      00      01  FB 0005A 8$:  CALLS  #1, BASS$STOP
57      DB  A5  D1 00061 9$:  CMPL  -40(FMP), ARGLIST
      0B  13 00065      BEQL  10$
00000000G 7E      00G  8F  9A 00067      MOVZBL #BASSK_FNEWITFUN, -(SP)
      00      01  FB 0006B      CALLS  #1, BASS$STOP
      56  D4 00072 10$:  CLRL  COUNTER
      0F  11 00074      BRB      12$
50      56      01  78 00076 11$:  ASHL  #1, COUNTER, R0
      50      FB A940 DE 0007A      MOVAL  -8(BSF$A_TEMP_STG)[R0], R0
      00000000G 00      16 0007F      JSB   STR$FREE1_DX_R4
      56      30  A7  F3 00085 12$:  AOBLEQ 48(ARGLIST), COUNTER, 11$
      EC      28  A7  3C 0008A      MOVZWL 40(ARGLIST), R7
      57      56  D4 0008E      CLRL  COUNTER
      0E  11 00090      BRB      14$
50      50      E0 B546 7E 00092 13$:  MOVAQ  @-32(FMP)[COUNTER], R0
      08  C2 00097      SUBL2  #8, R0
00000000G 00      16 0009A      JSB   STR$FREE1_DX_R4
      EE      56      57  F3 000A0 14$:  AOBLEQ  R7, COUNTER, -13$
      5D      55  D0 000A4      MOVL  FMP, FP
      05 000A7      RSB

```

```

: 0794
: 0783
: 0791
: 0803
: 0809
: 0816
:
: 0822
: 0823
:
:
: 0829
: 0831

```

; Routine Size: 168 bytes, Routine Base: _BASS\$CODE + 0000

```

: 271      0832 1
: 272      0833 1 END
: 273      0834 1
: 274      0835 0 ELUDOM

```

PSECT SUMMARY

Name	Bytes	Attributes
_BASS\$CODE	168	NOVEC, NOWRT, RD, EXE, SHR, LCL, REL, CON, PIC, ALIGN(2)

COMMAND QUALIFIERS

:
: BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LISS:BASENDDFS/OBJ=OBJ\$:BASENDDFS MSRC\$:BASENDDFS/UPDATE=(ENHS:BASENDDFS
:

: Size: 168 code + 0 data bytes
: Run Time: 00:06.1
: Elapsed Time: 00:16.1
: Lines/CPU Min: 8226
: Lexemes/CPU-Min: 29349
: Memory Used: 70 pages
: Compilation Complete

0022 AH-BT13A-SE
VAX/VMS V4.0

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